This letter will be added to the growing collection of Darwiniana in the American Museum of Natural History.

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SCIENTIFIC BOOKS

Our Mobile Earth. By REGINALD A. DALY. New York, Charles Scribner's Sons, 1926.

THIS book, "boldly planned on an endlessly difficult theme," is primarily intended for the general reader; even so, working geologists and especially teachers of the earth sciences will find "Our Mobile Earth" not only replete with facts but also interesting, and inspirational to deep thinking. The earlier chapters abound in short sentences, and in questions that are answered directly with examples and striking illustrations; toward the end, however, as the subject-matter becomes more difficult, the book becomes somewhat heavy reading. It goes easily from the known to the unknown, and finally becomes highly speculative, and why not, since "science progresses through systematic guessing in the good sense of the word"? Daly has made clear in this book many of the profound problems now so actively discussed by geologists and geophysicists everywhere, as to why the earth has high standing continents, vast oceanic basins, mountain chains, volcanoes and earthquakes.

Daly's theme, as his title shows, is the mobility of the earth's surface. This mobility is expressed in earthquakes, volcanic action, broad warpings of the crust, rising of mountains and subsiding of oceanic basins. The opening chapter is on "Great Earthquakes of History." The crust is under strain and at intervals it snaps and moves a little—"each snapping means an earthquake." Between 1885 and 1903, the seismographs of Japan recorded four earthquakes per day, while for the whole earth there is nearly one for each hour. Fortunately, however, most of them are on the oceanic bottoms. The following chapter on the "Nature of Earthquakes" makes it plain that our city fathers should above all study seismology and human psychology, for this knowledge is "to the millions of the future more precious than rubies."

These two stirring chapters lead naturally to a study of "The Earth's Interior," and thence into another striking chapter on volcanic action. The rigid crust, composed of crystallized granite and basalt, is, we learn, "about forty miles thick," and it rests upon a hot, easily yielding and uncrystallized substratum of basalt. This substratum is "potentially mobile" and in consequence gives rise to "the possibility of volcanic action, and of mountain chains." The granitic continents, of lighter materials, actually float on the heavier basalt of the substratum, just as an iceberg does in sea water. From the substratum rise, through great cracks in the crust, the materials extruded by the volcanoes. Furthermore, as the earth is a shrinking mass, due to loss of heat, to loss of material to the exterior (gases and rocks), and to compression, naturally the cold and rigid crust must also shrink, and it does so through folding, crumpling and overriding of masses. It is due to these internal changes that the face of our earth is mobile and has taken on, through the further action of erosion, the expression we see all about us.

Mainly through earthquake shocks and the resulting tremors or waves that travel rapidly around and through the earth, geologists have learned that the material of the earth is in layers or shells: at the center is the core of iron, making one sixth of the earth's mass; this is overlain by the transition shell, eight hundred miles thick, in which rock materials are introduced; and then follows the silicate shell, one thousand miles thick, in which the amount of iron becomes less and less, and which is in turn enclosed by the crust of the earth, about forty miles thick.

We are now prepared to understand the "Distortion of the Earth" and why there are mountain ranges, and then we are instructed as to the origin of these mountain ranges. In the last-mentioned chapter the climax of the book is attained, but to round out the subject another chapter is added on the "Evolution of the Face of the Earth."

It has long been known that Daly sees much of value in the Taylor-Wegener hypothesis of continental drift, which is now being widely discussed. This hypothesis, he holds, "must be seriously entertained as the true basis for a sound theory of mountain building. . . . Taylor and Wegener believe that the mountain chains of the globe were formed by the horizontal crushing of geosynclinal prisms which lay in front of *slowly moving, migrating continents.*" Parts of the continents are bowed or raised up and accordingly gravitate downhill, as it were, over the potentially mobile substratum, and so by their sliding force crumple together the weaker places in the crust. As he says, "The continents appear to have slid downhill, to have been pulled down, over the earth's body, by mere gravity; mountain structures appear to be the product of enormous, slow *landslides.*"

"Our solid earth, apparently so stable, inert and finished, is changing, mobile and still evolving. . . . And the secret of it all—the secret of the earthquake, the secret of the 'temple of fire,' the secret of the ocean basin, the secret of the highland—is in the heart of the earth, forever invisible to human eyes."

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